Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 22, 90, and 94	)	WT Docket No. 95-70
of the Commission's Rules to Permit	)	RM-8200
Routine Use of Signal Boosters	)	

MEMORANDUM OPINION AND ORDER

Adopted: May 14, 1997 **Released:** May 21, 1997

By the Commission:

I. INTRODUCTION AND EXECUTIVE SUMMARY

1. This *Memorandum Opinion and Order* addresses a Petition for Reconsideration ("Petition") filed by TX RX Systems, Inc. ("TX RX"), a manufacturer of signal boosters and amplifiers. Its Petition concerns limitations we placed on certain types of signal boosters in the *Report and Order* in this proceeding.[1] Signal boosters ("boosters") are low power transmitters used to enhance communications in tunnels, underground areas, inside buildings, and other areas in which signals are weakened by terrain or man-made obstacles. Boosters are not intended to increase the range of a station, but only to provide fill-in communications within a licensee's area of operation. TX RX requests that the restriction adopted in the *Report and Order* that limits the use of Class B broadband signal boosters[2] to confined or enclosed areas be removed. For the reasons set forth below, TX RX's Petition is denied.

[1] Amendments of Parts 22, 90, and 94 of the Commission's Rules to Permit Routine Use of Signal Boosters, WT Docket No. 95-70, *Report and Order,* 11 FCC Rcd 16621 (1996). On August 1, 1996, 47 C.F.R. Part 94 was incorporated into 47 C.F.R. Part 101. *See* Reorganization and Revision of Part 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, WT Docket No. 94-148, *Report and Order*, 11 FCC Rcd 13449 (1996).

[2] A Class B broadband signal booster amplifies and retransmits all signals within the booster's passband. *See* 47 C.F.R. § 90.7.

II. BACKGROUND

2. On June 5, 1996, the Commission released a *Report and Order* adopting rules concerning the use of boosters under Parts 22, 90, and 101 of the Rules.[3] These rules: (1) permit licensees to use boosters in Part 22 public paging operations in the 150 and 931 MHz bands, in Part 90 land mobile and paging operations above 150 MHz, and in Part 101 multiple address system operations in the 928-960 MHz band; (2) require that licensees using boosters correct any harmful interference caused to other systems; (3) establish service area radii for Part 22 booster operation; (4) limit the use of Class B boosters to confined or enclosed areas; (5) establish a booster maximum effective radiated power level of 5 watts per channel; and, (6) allow licensees to use boosters without additional authorization from the Commission. Prior to adoption of these rules, under our Part 90 Private Land Mobile Radio Service rules, boosters could only be used on ten 450-470 MHz frequency pairs in the Business Radio Service for communications related to the servicing and supplying of aircraft at certain specified airports.[4]

3. On July 19, 1996, TX RX filed a Petition requesting removal of the restriction that limited Class B booster use to confined or enclosed areas.[5] On August 21, 1996, Geotek Communications, Inc. (Geotek) filed an Opposition to the Petition ("Opposition"). On September 3, 1996, TX RX filed a Reply to the Opposition ("Reply").

III. CONTENTIONS OF THE PARTIES

4. In support of its request to permit unrestricted use of Class B boosters, TX RX states that pursuant to the adopted rules, and regardless of the class of booster used or the environment in which the booster is used, licensees using boosters must not cause interference to other authorized systems and must correct such interference if it occurs. TX RX contends that the fact that Class B boosters may retransmit other licensees' signals does not eliminate this responsibility. Further, TX RX notes that in the few known cases of interference caused by boosters, the problem has been solved by reducing the booster's amplifier gain.[6] TX RX also argues that requiring Class B boosters currently operating in open environments to be replaced with Class A boosters would serve no purpose and would increase costs for existing users.[7] In this regard,

[3] Amendments of Parts 22, 90, and 94 of the Commission's Rules to Permit Routine Use of Signal Boosters, *Report and Order, supra* n.1.

[4] *See* 47 C.F.R. § 90.75(c)(25).

[5] Petition for Reconsideration, WT Docket No. 95-70, filed July 19, 1996. The Petition was placed on Public Notice. *See* Report No. 2146 (August 7, 1996).

[6] Petition at 4, Reply at 3.

[7] Petition at 7.

TX RX states that it and other manufacturers have sold more than 500 boosters for use in the 800 and 900 MHz Specialized Mobile Radio (SMR) bands.[8] In its Opposition, Geotek argues that licensees who experience interference caused by a booster may not be able to readily identify the source of interference because there is no registration or notification requirement for the use of boosters. Geotek further argues that past patterns of interference in cellular configurations relied upon by TX RX in the Petition are not valid indicators for potential interference to SMR operators.[9] Geotek states that the restriction placed on Class B boosters adds necessary protection against harmful interference and should be retained.[10]

5. In its Reply, TX RX asserts that any interference from boosters can be easily identified and corrected because the same methods of identifying interference in a "non-booster" environment apply to areas in which boosters are employed.[11] TX RX also states that: (1) Geotek mistakenly infers that TX RX's reference to interference from boosters was limited to cellular systems; (2) TX RX is not familiar with boosters used in cellular operations; and, (3) in its Petition it was referring to the more than 500 boosters used in the 800 and 900 MHz SMR bands.[12] TX RX recommends that the Commission should rely on the near total absence of interference from boosters in the SMR environment as evidence that Class B boosters do not cause harmful interference and therefore should not be limited to use only in confined areas.[13]

IV. DISCUSSION

6. In the *Report and Order* we stated that Class B broadband boosters raise additional interference concerns because these devices amplify all signals within the design passband, including signals on frequencies that may be authorized to other licensees.[14] Rather than prohibit use of these devices, however, we limited their areas of operation. We concluded that this use restriction along with the general requirement for licensees employing boosters to correct

[8] Reply at 3.

[9] Opposition at 3.

[10] Opposition at 2-3.

[11] Reply at 2.

[12] *Id.* at 3.

[13] *Id.* at 4.

[14] For example, transmitting frequencies in a trunked group in the 800 MHz SMR band are not contiguous but rather separated by one megahertz. In this band there are 39 frequencies that lie between each frequency in a trunked group authorized to a particular licensee. This means that for a typical 5-channel trunked group there are 156 frequencies between the lowest frequency and the highest frequency being boosted that are not assigned to the licensee. Any of these frequencies could be assigned to other licensees in the same area.

interference were measures designed to address interference concerns raised by commenters.[15] TX RX has provided no new or additional information which warrants our elimination of the operation restriction on Class B boosters. Further, if as TX RX notes, authorizing boosters by rule will increase their use, there is even a greater need to restrict Class B boosters to minimize interference. As for the issue of existing users having to replace equipment, we note that our records indicate that no rule waivers to use boosters in the 800 and 900 MHz bands have been granted. Therefore, there should be no Class B boosters operating in the 800 and 900 MHz SMR bands and consequently, no need for licensees to replace equipment. Accordingly, we are retaining the limitations in 47 C.F.R. §§ 90.219(d) and 101.151(d) that Class B boosters may only be used in confined or enclosed areas.

7. TX RX also argues that the amended rules do not stipulate the physical placement of radiating elements of Class B boosters used within confined environments, and that a booster antenna could be placed just inside a confined area and emit significant radio frequency energy outside of that area.[16] This scenario was considered when formulating the adopted rules. First, signal boosters cannot be used to extend a system's normal signal coverage area. Second, the likelihood of more than one licensee having mobile units operating in the same frequency range in the same confined area (*i.e.*, tunnels, underground parking garages, etc.) would be minimal. Thus, the signals radiated from a Class B booster located inside a confined area would be only those frequencies assigned to the licensee employing the booster.

8. Finally, TX RX states that pursuant to the *Report and Order*, the use of Class B boosters is permitted not only in confined areas, but also in remote areas, and that it is unclear as to what constitutes a remote area.[17] We disagree with TX RX's characterization of our decision. There is no reference in the *Report and Order* or Section 90.219(d) of the Commission's rules regarding the use of Class B boosters in remote areas.[18] Thus, we conclude that clarification of the term "remote areas" is unnecessary. Moreover, we consider Section 90.219(d) of our rules to be clear as to where a Class B booster may be used.

[15] *Report and Order*, 11 FCC Rcd at 16628.

[16] Petition at 5.

[17] *Id.* at 6.

[18] Section 90.219(d), as adopted, states "Class B broadband boosters are permitted to be used only in confined or indoor areas such as buildings, tunnels, underground areas, etc., *i.e.*, areas where there is little or no risk of interference to other users".

V. CONCLUSION

9. For the reasons stated herein, we deny TX RX's request that the restriction in Sections 90.219(d) and 101.151(d) of the Rules limiting the use of Class B boosters to confined or enclosed areas be removed.

10. Accordingly, IT IS ORDERED, under the authority granted in Sections 4(i) and 303 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 4(i) and 303, that the Petition for Reconsideration filed by TX RX Systems, Inc. IS DENIED.

FEDERAL COMMUNICATIONS COMMISSION

William F. Caton
Acting Secretary